REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1, 7, 11, 13 and 22-28 have been amended. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-28 are pending and under consideration.

REJECTIONS UNDER 35 USC § 112, FIRST PARAGRAPH

In the Office Action, at page 2, claims 1-28 were rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth therein.

Office Action Item 3

Because the rejection explicitly states in Item 3 that the specification is enabling for at least one interpretation of the claims, there is no basis in Item 3 for a § 112, first paragraph rejection; one enabled interpretation is sufficient. There may be other enabled interpretations. Withdrawal of item 3's rejection of claims 1-28 is respectfully requested.

In a telephone discussion with Applicant's representative, the Examiner expressed difficulty reading the application. Therefore, pursuant to the same discussion, a paragraph has been added at page 8, line 9 of the specification ("The simulation apparatus may be constructed ... working means model."). This paragraph is based on other parts of the specification and provides early explanation of terms explained later in the specification. The Examiner agreed that this would likely overcome the § 112, first paragraph rejection in Item 3. The new paragraph is supported at least by the paragraph at page 15, line 24 of the original specification.

Office Action Item 4

The Examiner found the "coefficient" feature confusing. Consequently, claims 7 and 11 were rejected. Applicant respectfully submits that this feature is supported by the original specification. However, to remove any possible confusion, another paragraph has been added at page 8 ("Pre-existing coefficients or constants (referred to as "workability evaluation coefficients"), may be used, along with simulation output, to evaluate the workability of the working means model."). The Examiner agreed that this paragraph would help improve the readability of the specification. This paragraph is supported at least by the paragraph at page

17, line 23 of the original specification.

The rejection in Item 4 proposes that the specification states that the "workability coefficient" is evaluated, but does not specify how the workability coefficient is evaluated. The MPEP states that "The invention that one skilled in the art must be enabled to make and use is that [invention] *defined by the claim(s)* of the particular application or patent." (MPEP § 2164, first paragraph). Claims 7 and 11 have been amended to clarify the role of a "coefficient" (e.g. "a workability evaluation coefficient which is referred to for evaluating a workability of the working means", claim 7). The workability evaluation coefficient is not recited in any claim as being "evaluated". Rather, it is stored in the storage unit before any workability evaluation or simulation, and is then used in as a reference to evaluate the workability result of the workability simulation ("... coefficient storage section stores a workability evaluation coefficient which makes a reference for evaluation of a workability for each of the working methods ...", p. 18, lines 3-8). In sum, there is no requirement that the present specification enable "evaluation" of the workability coefficient, because "evaluation" of the coefficient is not claimed.

For consistency, the end of the paragraph beginning at page 55, line 25, has been amended to recite "... and the evaluation result management section 25 calculates a workability evaluation [coefficient] result regarding the arrival route confirmation and records a result of the calculation into the evaluation result data storage section 13 (step B21)." The paragraph at page 62, line 4 has been similarly amended. This change is consistent with the paragraph at page 67, line 14, which mentions "a *result* of workability evaluation calculated by the evaluation result management section 25 ... is stored into the evaluation result data storage section 13"). This is also consistent with the paragraph at page 36, line 15, which mentions "The evaluation result data storage section 13 stores a workability evaluation *result* calculated based on an evaluation result of the workability".

Withdrawal of Item 4's rejection of claims 7 and 11 is respectfully requested.

Office Action Item 5

Item 5 of the Office Action purports to reject "Claims 1-28". Only claims 24-28 recite the claim language mentioned in Item 5, and it is therefore assumed that Item 5 pertains only to claims 24-28.

Item 5 reasons that the word "manipulate" was not used in the specification. Section § 2175.03(e) of the MPEP states that "[t]here is no requirement that the words in the claim must

match those used in the specification disclosure. Applicants are given a great deal of latitude in how they choose to define their invention ...". Although the choice of "manipulate" over "work" is within Applicant's latitude in claiming the present invention, claims 24-28 have been amended to recite "work/working", rather than "manipulate". This amendment does not significantly change the scope of claims 24-28.

Withdrawal of Item 5's rejection of claims 24-28 is respectfully requested.

REJECTIONS UNDER 35 U.S.C. §§ 102 and 103

In the Office Action, at pages 4-13, claims 1-6, 13-19, 22 and 24-28 were rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Sato. At pages 13-16, claims 7, 20 and 21 were rejected under 35 U.S.C. § 103 as obvious over Sato in view of Hirata (USP # 6,157,902). At pages 16 and 17, claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as obvious over Sato in view of Doi (USP # 5,590,268). At pages 18-21, claims 10 and 11 were rejected under 35 U.S.C. § 103(a) as obvious over Sato in view of Arita (USP # 6,205,367) and Hirata (USP # 6,157,902). At pages 22 and 23, claims 12 and 23 were rejected under 35 U.S.C. § 103(a) as obvious over Sato in view of Carver (USP # 5,106,290). These rejections are traversed and withdrawal is respectfully requested.

Incorrect Claim Interpretation

Item 6 of the Office Action states that "**Working means model** refers to the actual tool model and the hand model ..." Features of the specification are not read into the claims; the claims speak for themselves. The "working means model" is not in "means-for" form, and is not a § 112 paragraph 6 construct. It is respectfully submitted that the "working means model", in the claims, has its plain meaning, and may be interpreted to include a tool model, *or* a hand model, *or* any other equivalent that falls within the meaning of the phrase.

Item 6 also states that "**Virtual three-dimensional space** has the **three-dimensional CAD images** of components, standard parts, tools and hand and displays the assembly, disassembly and other processes and are displayed on the computer monitor as specified on Page 59, Lines 10, 16, and 26". It is respectfully submitted a virtual three-dimensional space is simply a representation of three-dimensional data, and that the limitations introduced by the Examiner are not necessary to interpret the claims. For example, three-dimensional data does not require CAD images or actual display; other forms of data may be used, and a virtual three-

dimensional space can exist without being displayed. Similarly, a "virtual tool model" may have embodiments other than a CAD model.

Working Means Model

Amended claims 1, 13, 22, and 23 recite working means model information, which indicates details of a working means model to be used in working on the one or more standard part models and which is linked with the standard part model information. Sato neither teaches nor suggests this feature. Carver was not cited for, and does not suggest or add this feature to claim 23. Withdrawal of the rejection of claims 1, 13, 22, and 23 is respectfully requested.

Claim 1 recites "automatically referring, based on information regarding the standard part models arranged in a design model, to said working means model information storage section to extract information regarding a working means model to be used to work the standard part models arranged in the design model". Claim 13 recites "automatically acquiring the working means model, which is to be used in working on the individual standard part model, based on said working means model information linked with said standard part model information that indicates the details of the last-named individual standard part model". Claim 22 recites "automatically acquiring said working means model information, which is to be linked with the working means model to be used in working on the individual standard part models used upon designing of a design model". Claim 23 recites "attribute information extraction section for referring to said standard part model information storage section to automatically extract attribute information of a working means model to be used to work the standard part models arranged in the subject designed in the virtual three-dimensional space".

In other words, these claims use the part model information to automatically acquire or refer to the working means model. Workability can therefore be simulated without manually referring to the correct tool to work the part model. Sato neither teaches nor suggests this automatic working means/tool extraction feature. Carver was not cited for, and does not suggest or add this feature to claim 23. Withdrawal of the rejection of claims 1, 13, 22, and 23 is further respectfully requested.

Claims 24 and 27

Claim 24 recites "automatically determining whether the arranged working model can work the component model, by automatically comparing the arrangement information and the working requirements of the working model to the main model". Claim 27 recites automatically

determining "by using the main model and working requirements of the working model to automatically simulate the working model working upon the component model". As stated by the rejection, "SA ... allows the user to manipulate the three-dimensional CAD/CAM models" (items 8.15 and 8.18). User manipulation is not the same as "automatically determining", as recited in claims 24 and 27. Withdrawal of the rejection of claims 24 and 27 is respectfully requested.

Improper Motive to Combine

The rejection failed to provide a proper motive for combining the prior art references. MPEP § 2144.08 states that "Where applicable, the [Examiner's] findings should clearly articulate which portions of the reference support any rejection. Explicit findings on motivation or suggestion to select the claimed invention should also be articulated in order to support a 35 U.S.C. 103 ground of rejection ... Conclusory statements of similarity or motivation, without any articulated rationale or **evidentiary support**, do not constitute sufficient factual findings." Furthermore, Ex parte Obukowicz, 27 USPQ 2d 1063, 1065 (B.P.A.I. 1992) states that "The examiner can satisfy this burden [of showing obviousness] only by *showing some objective teaching in the prior art ... would lead that individual to combine* the relevant teachings of the references." In other words, an obviousness rejection must be supported by a motive to combine the prior art references, and the motive must be found in the prior art.

The § 103 rejections propose motives for combining the prior art references. For example, on page 14 of the Office Action, the rejection states that "it would facilitate evaluating the workability evaluation ... and developing better manipulation algorithms", and "It would have been obvious to modify ... as it would facilitate later analysis of workability and developing better manipulation algorithms". Similar motives are given on pages 15-23. The motives are improper because they are not found in the prior art.

As discussed above, the motive to combine or modify a prior art reference must be found in the prior art. The rejection does not point to what prior art provides the relied-on motives. The elements to be combined are cited with reference to prior art, but the actual motives to combine the elements are based only on the apparent personal knowledge of the Examiner. The motives are advantages that the Examiner believes would result from the proposed combinations. However, this reasoning presupposes the existence of the combination. The Examiner has not provided any reasoning on why those properties would have been expected before such combination.

The Examiner must specifically show where the prior art, before being combined, suggests the desirability of being combined. In other words, the Examiner must show where Sato or some other reference, *before* being combined, indicates that the proposed combination or modification would have been desirable, or what in the prior art would have led one to combine their relevant teachings. However, the Examiner has not provided such a motive, but rather has only discussed desirable properties *after* they have been combined. The Examiner is respectfully requested to withdraw the §103 rejection or provide a proper motive for combining the prior art references.

It is respectfully noted that if a later Office Action includes a new motive for combining the prior art (a motive found in the prior art), such would constitute a new ground for rejection not necessitated by amendment to the claims. Therefore, it is respectfully requested that any next Office Action, if issued, be made non-Final.

DEPENDENT CLAIMS

The dependent claims are deemed patentable due at least to their dependence from allowable independent claims. These claims are also patentable due to their recitation of independently distinguishing features. For example, claim 2 recites "working means model information extraction section refers to said working means model information storage section based on the attribute information to extract the information regarding the working means model". This feature is not taught or suggested by the prior art. Withdrawal of the rejection of the dependent claims is respectfully requested.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please ADD the following paragraphs at page 8, line 9 of the specification:

The simulation apparatus may be constructed such that the working means model information storage section stores information of one ore more tool models, which may be, for example, models of actual tools and/or a hand model which is a model of a hand of a worker as the information regarding the working means model.

Pre-existing coefficients or constants (referred to as "workability evaluation coefficients"), may be used, along with simulation output, to evaluate the workability of the working means model.

Please REPLACE the paragraph at page 17, line 11, with:

Further, the simulation apparatus 1 may further comprise a workability evaluation coefficient storage section for storing, for the working means model included in the same attribute, a workability evaluation coefficient which [makes] is used as a reference for [evaluation of] evaluating a workability of the working means model, and a workability evaluation section for evaluating the workability based on a result of execution of the working simulation by the working simulation execution section 4 and also based on the workability evaluation coefficient stored in the workability evaluation coefficient storage section.

Please REPLACE the paragraph at page 17, line 23, with:

In this instance, the simulation apparatus 1 may be constructed such that the working means model information storage section 3 stores information of a plurality of reference positions for any working means model which allows operation thereof in a plurality of different methods and the working simulation execution section 4 executes a working simulation according to the plurality of operation methods while the workability evaluation coefficient storage section stores a workability evaluation coefficient which [makes] is used as a reference for [evaluation of] evaluating a workability for each of the operation methods of the working means model, and the workability evaluation section evaluates the workability of the working means model for each of the working methods based on a result of execution of the working simulation according to the working method and is also based on the workability evaluation coefficient stored for the operation method of the working means model in the workability

evaluation coefficient storage section.

Please REPLACE the paragraph at page 55, line 17, with:

By the way, if it is discriminated in step B9 or step B10 described above that the working means model arrives at the position of the standard part model without suffering from interference with any other part model (when it is detected that the working means model arrives at the standard part model or it is detected that interference between the working means model and the standard part model 42 occurs), then the general controller 21 controls the monitor 14 to display the condition after the movement (step B20; refer to FIG. 19), and the evaluation result management section 25 calculates a workability evaluation [coefficient] result regarding the arrival route confirmation and records [a] the workability evaluation result of the calculation into the evaluation result data storage section 13 (step B21).

Please REPLACE the paragraph at page 62, line 4, with:

When the working range amount is calculated in such a manner as described above, the evaluation result management section 25 calculates a [working] workability evaluation [coefficient] result for the working range amount and registers [a] the workability evaluation result of the calculation into the evaluation result data storage section 13 (step B38). Then, the general controller 21 reports the process till then (for example, the result of confirmation of the arrival route of the working means model, the result of confirmation of calculation of the working range amount and the result of evaluation of the workability) as a simulation result through the printing apparatus not shown, the monitor 14 and so forth (step B19).

IN THE CLAIMS:

Please AMEND the claims as follows:

1. (ONCE AMENDED) A simulation apparatus for simulating, based on design information of a design model designed in a virtual three-dimensional space while one or more standard part models standardized in advance based on a specification model are arranged in the design model, working for the standard part models arranged in the design model, comprising:

a working means model information storage section for storing working means model information [regarding] which indicates details of a working means model [related to] to be used in working on the one or more standard part models [for working the standard part models], said

working means model information being linked with standard part model information which indicates details of the one or more standard part models;

a working means model information extraction section for automatically referring, based on information regarding the standard part models arranged in a design model, to said working means model information storage section to extract information regarding a working means model to be used to work the standard part models arranged in the design model; and

a working simulation execution section for executing a simulation of the working for the standard part models with the working means model based on design information of the design model and the information regarding the working means model extracted by said working means model information extraction section.

2. (AS UNAMENDED) A simulation apparatus as claimed in claim 1, wherein the information regarding the standard part models arranged in the design model include attribute information of the working means model related to the standard part models, and said working means model information extraction section refers to said working means model information storage section based on the attribute information to extract the information regarding the working means model.

3. (AS UNAMENDED) A simulation apparatus as claimed in claim 1, wherein said working means model information storage section stores information of one or more tool models which are models of actual tools and/or a hand model which is a model of a hand of a worker as the information regarding the working means model.

4. (AS UNAMENDED) A simulation apparatus as claimed in claim 1, wherein the information regarding the working means model stored in said working means model information storage section includes reference position information of the working means model when the working means model works the standard part models while the design information of the design model includes reference position information of the standard part models when the working means model works the standard part models, and said working simulation execution section performs a simulation of a relationship in position/posture of the working means model to the standard part models based on the reference position information of the working means model and the standard part models.

5. (AS ONCE AMENDED) A simulation apparatus as claimed in claim 1, further comprising an interference checking section for checking interference of the working means model while said working simulation execution section executes a simulation of the standard part models working with the working means model.

6. (AS UNAMENDED) A simulation apparatus as claimed in claim 5, wherein said interference checking section checks interference of the working means model including a route along which the working means model arrives at one of the standard part models when the standard part model arranged in the design model is worked using the working means model.

7. (ONCE AMENDED) A simulation apparatus as claimed in claim 2, further comprising a workability evaluation coefficient storage section for storing, for the working means model included in the same attribute, a workability evaluation coefficient which [makes a reference for] is referred to for evaluating [evaluation of] a workability of the working means model, and a workability evaluation section for evaluating the workability based on a result of execution of the working simulation by said working simulation execution section and also based on the workability evaluation coefficient stored in said workability evaluation coefficient storage section.

8. (AS UNAMENDED) A simulation apparatus as claimed in claim 1, wherein said working means model information storage section stores information regarding a working condition necessary for working for the working means model as information regarding the working means model, and said working simulation execution section executes a working simulation based on the information regarding the working condition of the corresponding working means model stored in said working means model information storage section.

9. (AS UNAMENDED) A simulation apparatus as claimed in claim 8, wherein said working means model information storage section stores information regarding working spaces necessary for working with the working means model as the information regarding the working conditions of the individual working means model.

10. (AS UNAMENDED) A simulation apparatus as claimed in claim 4, wherein said working means model information storage section stores information of a plurality of reference

positions for any working means model which allows operation thereof in a plurality of different methods, and said working simulation execution section executes a working simulation according to the plurality of operation methods.

11. (ONCE AMENDED) A simulation apparatus as claimed in claim 7, wherein said working means model information storage section stores information of a plurality of reference positions for any working means model which allows operation thereof in a plurality of different methods and said working simulation execution section executes a working simulation according to the plurality of operation methods while said workability evaluation coefficient storage section stores a workability evaluation coefficient which [makes a reference for evaluation of] is referred to for evaluating a workability for each of the operation methods of the working means model, and said workability evaluation section evaluates the workability of the working means model for the each of the working methods based on a result of execution of the working simulation according to the working method and also based on the workability evaluation coefficient stored for the operation method of the working means model in said workability evaluation coefficient storage section.

12. (AS UNAMENDED) A simulation apparatus as claimed in claim 1, wherein at least one of a fastening part model, an adjustment part model and a connector part model is used for the standard part models.

13. (ONCE AMENDED) A simulation method for simulating, based on data regarding a design model displayed in a virtual three-dimensional space and designed while one or more standard part models standardized in advance based on a specification model are arranged in the design model, workability according to a working means model used to work the standard part models arranged in the design model, comprising [the steps of]:

providing working means model information, which indicates details of a working means model to be used in working on the one or more standard part models, and standard part model information, which indicates details of the one or more standard part models, said working means model information being linked with said standard part model information [relating a working means model to one or more standard part models];

automatically acquiring the working means model, which is to be used in working on the individual standard part model, based on said working means model information linked with said

standard part model information that indicates the details of the last-named individual standard part model [related to the standard part models used upon designing of a design model];

executing a simulation of working to be performed for the standard part models using the acquired working means model information; and

displaying a process of the execution of the simulation in a virtual three-dimensional space.

14. (AS UNAMENDED) A simulation method as claimed in claim 13, wherein, as the simulation of the working to be performed for the standard part models, a simulation of at least one kind of working from among assembling working, disassembling working, adjustment working and maintenance working for the standard part models is performed.

15. (AS UNAMENDED) A simulation method as claimed in claim 13, wherein, where a tool is used to work the standard part models, the tool and a hand of a worker who uses the tool are used as the working means model to perform the simulation of the working.

16. (AS UNAMENDED) A simulation method as claimed in claim 13, wherein, where the standard part models are to be worked by a hand of a worker itself, the hand of the worker is used as the working means model to perform the simulation of the working.

17. (AS UNAMENDED) A simulation method as claimed in claim 15, wherein, when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space.

18. (AS UNAMENDED) A simulation method as claimed in claim 16, wherein, when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space.

19. (AS UNAMENDED) A simulation method as claimed in claim 13, wherein a process through which the working means model arrives at one of the standard part models which provides a subject position and a manner of working performed based on a condition

defined in advance for the working means model are displayed as the process of execution of the simulation of the working.

20. (AS UNAMENDED) A simulation method as claimed in claim 19, wherein, after the working performed based on the condition defined in advance for the working means model is completed, a process through which the working means model is spaced away from the subject position based on a condition defined in advance for the standard part models is displayed, and after the working means model is spaced by a predefined distance away from the subject position, the display of the working means model or the working means model and the standard part models is erased.

21. (AS UNAMENDED) A simulation method as claimed in claim 13, wherein, when interference occurs with the working means model in a process of execution of the working to be performed for the standard part models with the working means model, an occurrence condition of the interference is displayed.

22. (ONCE AMENDED) A computer-readable recording medium having a simulation program recorded thereon for causing, in order to cause a computer to execute, based on design information of a design model designed in a virtual three-dimensional space while one or more standardized standard part models are arranged in the design model, a simulation of working with a working means model used to work the standard part models arranged in the design model, the computer to implement:

a function of providing working means model information, which indicates details of a working means model to be used in working on the one or more standard part models, and standard part model information, which indicates details of the one or more standard part models, said working means model information being linked with said standard part model information;

a function of automatically acquiring said working means model information, which is to be linked with the working means model to be used in working on the individual [regarding a working means model related to one or more] standard part models used upon designing of a design model;

a function of executing a simulation of working to be performed for the standard part models based on the acquired information of the working means model; and

a function of displaying a process of the execution of the simulation in a virtual three-dimensional space.

23. (ONCE AMENDED) A designing supporting apparatus, comprising:

a standard part model information storage section for storing standard part model information regarding one or more standard part models standardized in advance based on a predetermined specification model; and

a designing supporting section for arranging one or more standard part models to perform supporting for designing a subject in a virtual three-dimensional space;

said designing supporting means including an attribute information extraction section for referring to said standard part model information storage section to automatically extract attribute information of a working means model to be used to work the standard part models arranged in the subject designed in the virtual three-dimensional space, and a design data outputting section for outputting data regarding the subject designed in the virtual three-dimensional space and data regarding the attribute information extracted by said attribute information extraction section as design data, said attribute information including working means model information, which indicates details of a working means model to be used in working on the one or more standard part models and which is linked with said standard part model information.

24. (ONCE AMENDED) An apparatus for simulating work upon a model [manipulation], comprising:

a main model comprised of a [manipulatable] workable component model;

a [manipulator] working model, separate from the main model, capable of [virtually] [manipulating the manipulatable] working the workable component model in a virtual three-dimensional space according to [manipulation] working requirements of the [manipulator] working model;

arrangement information describing an arrangement of the [manipulation] working model when it is working [manipulating] the component model; and

a processing unit automatically determining whether the arranged [manipulation] working model can [virtually manipulate] work the component model, by automatically comparing the arrangement information and [manipulation] the working requirements of the [manipulation] working model to the main model.

25. (ONCE AMENDED) The apparatus according to claim 24, wherein the processing unit also determines whether the [manipulation] working model can be [virtually] moved in the virtual three-dimensional space to its arrangement without interference between the moving [manipulation] working model and the main model.

26. (ONCE AMENDED) The apparatus according to claim 25, wherein orientation information is associated with the component model, and determining whether the [manipulation] working model can be [virtually] moved in the virtual three-dimensional space to its arrangement further comprises determining whether the [manipulation] working model can approach the component model according to the orientation information, without interference from the main model.

27. (ONCE AMENDED) A method for simulating [model manipulation], comprising:

arranging a [manipulation] working model into a [manipulation] working arrangement, according to an arrangement of a component model of a main model; and

automatically determining whether the [manipulation] working model, as arranged in its [manipulation] working arrangement, can [virtually manipulate] work upon, in virtual three-dimensional space, the component model, by using [comparing] the main model [to manipulation] and working requirements of the [manipulation] working model to automatically simulate the working model working upon the component model.

28. (ONCE AMENDED) The method according to claim 27, further comprising determining whether said arranging can be performed without interference between the main model and the [manipulation] working model.